

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US97/06831

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.: 89-92 & 145 because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

The subject matter of claims 89-92 are not supported by the disclosure.
The meets and bounds of claim 145 can not be determined, since this claim depends from a non-existent claim 444.

3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,E	US 5,625,694 A (LEE ET AL) 29 April 1997, see abstract and figs. 1-9.	1-7, 82-88, 93-112 & 184-191

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A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :G07B 17/04

US CL :364/464.2; 235/375; 380/55

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 235/375,380,381; 364/464.11,464.18,464.2; 380/55

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4,743,747 A (FOUGERE ET AL) 10 May 1988, see abstract and figs. 2 & 3.	8-35 & 113-138
X	US 4,802,218 A (WRIGHT ET AL) 31 January 1989, see abstract.	1-7, 82-88, 93-112 & 184-191
X	US 4,809,185 A (TALMADGE) 28 February 1989, see abstract and figs 1-4.	1-7, 82-88, 93-112 & 184-191
X	US 4,831,555 A (SANSONE ET AL) 16 May 1989, see abstract and fig. 2.	8-35 & 113-138
X	US 4,837,701 A (SANSONE ET AL) 06 June 1989, see abstract and fig. 7.	8-35 & 113-138

Further documents are listed in the continuation of Box C. See patent family annex.

• Special categories of cited documents:	• T	later document published after the international filing date or priority date and not in conflict with the application but cited to understand a principle or theory underlying the invention
• A* document defining the general state of the art which is not considered to be of particular relevance	• X*	document of particular relevance considered novel or nonobvious when the document is taken
• E* earlier document published on or after the international filing date	• Y*	document of particular relevance considered to involve an inventive step when combined with one or more other documents being obvious to a person skilled in the art
• L* document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	• &*	document member of the same patent family
• O* document referring to an oral disclosure, use, exhibition or other means		
• P* document published prior to the international filing date but later than the priority date claimed		

*Amend. document
5-11-97*

Date of the actual completion of the international search	Date of mailing of the international application
29 JUNE 1997	04 AUG 1997

Name and mailing address of the ISA/US
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International application No.

PCT/US97/06831

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4,853,864 A (HART ET AL) 01 August 1989, see abstract and fig. 3.	8-35 & 113-138
X	US 4,858,138 A (TALMADGE) 15 August 1989, see abstract and figs. 1-4.	1-7, 82-88, 93-112 & 184-191
X	US 4,900,903 A (WRIGHT ET AL) 13 February 1990, see abstract.	1-7, 82-88, 93-112 & 184-191
X	US 4,900,904 A (WRIGHT ET AL) 13 February 1990, see abstract.	1-7, 82-88, 93-112 & 184-191
A	US 4,933,849 A (CONNELL ET AL) 12 June 1990, see abstract.	1-88, 93-143 & 145-191
X	US 4,947,333 A (SANSONE ET AL) 07 August 1990, see abstract and figs. 3, 7 & 8.	8-35 & 113-138
A	US 4,959,795 A (CHRISTENSEN ET AL) 25 September 1990, see abstract.	1-88, 93-144 & 146-191
A	US 4,998,204 A (SANSONE ET AL) 05 March 1991, see abstract.	1-88, 93-144 & 146-191
A	US 4,999,481 A (BAER ET AL) 12 March 1991, see abstract.	1-88, 93-144 & 146-191
A	US 5,283,744 A (ABUMEHDI ET AL) 01 February 1994, see abstract.	1-88, 93-144 & 146-191
X	US 5,490,077 A (FREYTAG) 06 February 1996, see abstract and figs 1-15.	1-7, 82-88, 93-112 & 184-191
A	US 5,508,933 A (ABUMEHDI) 16 April 1996, see abstract and fig. 2.	1-88, 93-144 & 146-191
A,P	US 5,535,279 A (SEESTROM) 09 July 1996, see abstract.	1-88, 93-144 & 146-191
X,P	US 5,602,743 A (FREYTAG) 11 February 1997, see abstract and figs. 1-3, 7, 9 & 10.	1-88, 93-144 & 146-191
A,P	US 5,602,921 A (RAMADEI) 11 February 1997, see abstract.	1-88, 93-144 & 146-191
A,P	US 5,608,636 A (GUENTHER) 04 March 1997, see abstract.	1-88, 93-144 & 146-191